THE DEVELOPMENT OF REGION-SPECIFIC PAINTING PROBES FROM SINGLE MICRODISSECTED RAT CHROMOSOMES. K. Matsumoto* and J.D. Tucker. BBRP, PO Box 808, L-452, Lawrence Livermore National Laboratory, Livermore, CA.

Fluorescence *in situ* hybridization (FISH) using whole chromosome painting probes (WCPs) has been widely applied to identify structural chromosome rearrangements in metaphase cells. In interphase nuclei, however, WCPs do not work well for detection of chromosome rearrangements because the fluorescent signals are generally too diffuse. If a sequence of regions along one chromosome are differentially painted by multi-color FISH, it is possible that chromosome damage may be detectable in interphase nuclei. We have generated region-specific painting probes for rat chromosome 1 by microdissection. Single copies of targeted chromosomal regions were dissected with a glass micro needle from normal metaphase chromosomes derived from rat peripheral blood lymphocytes. The dissected fragments were pre-amplified by degenerate oligonucleotide primed (DOP)-PCR using T7 DNA polymerase after Topoisomerase I treatment (Guan *et al.*, Hum. Mole. Genet., 2:1117-1121, 1993). A conventional DOP-PCR reaction was then performed. Amplified DNA products were labeled with either biotin-16-dUTP or digoxigenin-11-dUTP by PCR. We have now obtained three probes corresponding to chromosome regions 1q11-q12, 1q31-35 and 1q51-53. FISH analysis using these probes showed specific signals corresponding to the dissected regions. Significantly, the fluorescent signals are of sufficient intensity that they can be visualized as bright spots in interphase nuclei. We are currently evaluating the usefulness of these probes for detecting structural and numerical chromosome aberrations in interphase nuclei by multi-color FISH. This work was performed under the auspices of the US DOE by LLNL under contract No. W-7405-ENG-48 with support from NIH grant PO1CA-55861.